REPORT NO. 76-2-2 SEPTEMBER 1975

EVALUATION OF THE SOUTHERN PINE BEETLE INFESTATION ON KISATCHIE NATIONAL FOREST, LOUISIANA

by

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INTRODUCTION

Aerial sketch map surveys and ground examinations were conducted on all districts of the Kisatchie National Forest in Louisiana (948,482 acres) during early June 1975. The purpose of this evaluation was to determine the current status of the southern pine beetle population.

METHODS

A 50 percent aerial sketch map survey[2/] was conducted on the Kisatchie, Evangeline, Catahoula, Caney and Winn Ranger Districts, and a 25 percent aerial sketch map survey was conducted on the Vernon Ranger District, in evaluating the southern pine beetle population. A portion of the spots detected during the aerial phase of the evaluation was examined on the ground to confirm the cause of mortality and the percentage of active spots.

TECHNICAL INFORMATION

Insect - Southern pine beetle (Dendroctonus frontalis, Zimm.).

Hosts - All species of southern yellow pine.

Preferred Hosts - Loblolly pine (Pinus taeda, L.) and shortleaf pine (P. echinata, Mill.).

Type of Damage - Death of the tree is the result of cambial mining by the southern pine beetle as they construct their galleries. The beetle also introduces the blue stain fungi, Ceratocystis spp., which slows down or blocks conduction of water in the stem.

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2/ Detection of forest pests in the Southeast 1970. USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF-7, Atlanta, Georgia.

Life Cycle of the Beetle - The beetles attack in pairs and construct "S" shaped galleries in the cambial region. Eggs are deposited in niches along the sides of these galleries. The eggs hatch into whitish grubs that further mine the inner bark and then construct cells in the bark for pupation. The callow adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer, and as many as seven generations may be produced in a year.

The central Louisiana area received abnormally high amounts of rainfall during late spring and early summer. This probably kept infested tree crowns from fading during the spring. Ground checks revealed most southern pine beetle spots occurred in low, poorly drained areas and along creek beds.

RESULTS

Southern pine beetle populations continue to remain at endemic levels on the Kisatchie National Forest. Although this evaluation indicates a slight overall increase in the number of infested trees per thousand acres of host type, activity still remains at a relatively low infestation level (Table 1). Overall numbers of infested trees per thousand acres host type have been 2.21, 1.19 and 3.28 for 1973, 1974 and 1975 respectively (Terry et.al., 1973; Terry et.al., 1974). According to aerial survey data (Table 2), only the Vernon Ranger District had spots containing more than 20 trees. Sixty-five percent of the spots examined on the ground were found to be actively infested with southern pine beetle.

The bombing and firing ranges of the Fort Polk Military reservation are located on the northern half of the Vernon Ranger District. During days when the ranges are "hot" civilian air and ground travel are restricted; consequently, the evaluation was conducted on the southern portion of the district only.

Tables 1 and 2 summarize the results for each of the districts.

DISCUSSION AND RECOMMENDATIONS

Average tree mortality levels have remained low for the past three years on the Kisatchie National Forest. However, within the Forest, levels vary with the Vernon and Catahoula Ranger Districts having the highest populations, and the Caney and Evangeline Ranger Districts having the lowest populations.

Table 1. Summary of the results of southern pine beetle evaluations conducted on the Caney, Catahoula, Evangeline, Kisatchie, Vernon and Winn Ranger Districts, Kisatchie National Forest, Louisiana. June-July 1975.[1/]

	Ownership Unit (Districts)						
	Catahoula	Winn	Caney	Kisatchie	Evangeline	Vernon[2/]	Total
1. Results compiled from data collected during the aerial phase of the evaluation							
Survey type	50 Percent Aerial Sketch Map						
Date of Survey	6/10	6/24	6/24	6/25	7/2	7/24	
Total acreage surveyed	185,897	290,955	60,093	115,639	193,898	42,000	888,482
Total susceptible host type acreage	73,780	101,060	19,220	61,380	60,140	26,040	341,620
Total number of spots within survey boundaries	276	364	60	141	54	311	1,206
Spots per M acres host type	3.73	3.60	3.16	2.40	0.90	11.96	3.53
Average spot size (trees)	1.80	1.32	1.63	1.48	1.23	3.25	1.97
Range of spot sizes (trees)	1-15	1-10	1-5	1-6	1-10	1-25	1-25
Reds and faders per M acres host type	6.71	4.75	5.15	3.54	1.07	38.8	6.95
2. Results compiled from data collected during ground and aerial phases of the evaluation							
Date of ground phase	6/23	6/24	6/30	6/25	7/2	7/24	
Total number of infested trees	452	480	24	248	18.2	1,538	2760.2
Infested trees per M acres host type	6.12	4.75	1.2	4.04	0.30	[3/]	3.28
Total volume of infested trees (bd.ft.)	5,670	3,869	93	5,895	75	5,271	36,348
Total volume of infested trees (cu.ft.)	1,592	2,130	440	175	0	1,414	3,621

1/ Corrected and expanded data.
2/ A 25% aerial sketch map survey was done on the Vernon District.
3/ Numbers of infested trees/M acres host type could not be accurately estimated due to inadequate ground check data and, therefore, are omitted in infestation levels.

Table 2. Summary of aerial survey data - southern pine beetle evaluation, Kisatchie National Forest, May-June 1975.[1/]

Ownership	Spot Size (Trees)						
	Singles	2-5 Spots-Trees	6-20 Spots-Trees	21-50 Spots-Trees	51+ Spots-Trees	Total Spots-Trees	Avg.Multip Tree-Spot Size
Caney	44	16-54	0	0	0	60:98	3.38
Catahoula	217	43-120	16-160	0	0	276:497	4.75
Evangeline	33	0	21-149	0	0	54:182	7.10
Kisatchie	129	12-84	6-36	0	0	147:219	5.00
Vernon	222	44-185	40-480	5-125	0	311:1012	8.88
Winn	323	36-112	5-45	0	0	364:480	3.83
TOTAL ALL DISTRICTS	968	151;525	88-870	5-125		1212:2488	5.49

1/ Data corrected and expanded to 100 percent survey area coverage according to Aldrich et al., 1958.

Districts have not received southern pine beetle suppression funds since the end of FY 75 and, consequently, have not been able to conduct normal monthly presuppression surveys. The Winn Ranger District conducted a presuppression survey in August and detected only six spots. Populations are not expected to increase above present levels for the remainder of this activity season.

High amounts of rainfall this spring could have placed abnormal stress on trees, especially in poorly drained areas, and for this reason it is possible that next spring southern pine beetle populations could increase substantially. Present beetle populations on all districts should be monitored closely, with special attention given to areas that have a history of southern pine beetle activity and low, poorly drained areas.

In view of the low southern pine beetle populations over several seasons on the Kisatchie National Forest, suppression is no longer recommended for most of the Forest. Only the Vernon and Catahoula Ranger Districts should continue their suppression projects.

Salvage operators continually scout and locate southern pine beetle spots, thus effecting a ground surveillance for the districts. Infested trees should be removed by salvage sales whenever possible. If salvage is not possible and the southern pine beetle spot is located in high value areas or areas where a potentially great loss may occur such as plantations, recreation areas or high value sawtimber areas, control through chemical treatment with a one-half percent lindane solution or pile and burn is recommended.

REFERENCES

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